

WORKSHEET 1
SUMMARY SCORE SHEET

Site Name/Location (Street, City, County, Section/Township/Range, TCP ID Number):

Treoil Industries	T39N/R01E/S08
4242 Aldergrove Road	Facility Site I.D. 2919
Ferndale WA, 98248	

Site assessed/ranked for February 27, 2001 Site Register

Site Description (Include management areas, substances of concern, and quantities):

Treoil Industries: A Brief Summary of Events

Treoil Industries, Inc. is located at 4242 Aldergrove Road in Ferndale, WA, and is approximately three miles east of the Strait of Georgia, in an area containing numerous wetlands.

Treoil Industries distilled tall oil, a by-product of pine trees from pulp mills. Tall oil contains various wood components, including pitch, pine oil, fatty acids, wood alcohols, resin acids and wood breakdown by-products. Four distillation fractions were pulled off the columns at various stages, and cooled as final products. Steam, the final substrate remaining, was condensed, treated using an oil/water separator and filtration, and discharged off the property via a settlement sump. The four fractions were cooled using a non-contact cooling water system (or air), and the cooling towers were drained into the settlement sump and ditch system quarterly. This cooling water reportedly contained biocides (Department of Ecology NWRO Inspection Report, 12/10/91). Boiler blowdown resulted in a third waste stream, and this stream contained unidentified descaling compounds.

Treoil experienced a spill event in October of 1991, reported to the Washington State Department of Ecology (Ecology) by an employee of ARCO, which consisted of pine oil travelling a distance of approximately .7 miles in a ditch along Aldergrove Road (southern boundary of ARCO) and 100 yards south along Gulf Road. This spill resulted in drop-in inspections by Ecology's Northwest Regional Office and a penalty for failure to report by Treoil. The inspection reports noted oil contamination of soils, oil in the settlement ditch and collection sump, drums located around the property, emulsion agents spilled onto the soil, and overall poor housekeeping. The site was added to Ecology's Confirmed and Suspected Contaminated Sites List May 9, 1994, for confirmed contamination of soil by petroleum products.

Mindy Miller of Whatcom County Health & Human Services (WCHHS) and Michael Spencer of Ecology visited Treoil on March 2, 2000, as part of a site hazard assessment (SHA) under the Model Toxics Control Act (MTCA). The site was fenced and gated on the southern side of the property (entrance), and no one was present. The property appeared abandoned, and since no responses to notices regarding the SHA had been received, the property was accessed from the northern unfenced portion. Noted at the site were numerous 55 gallon drums in the blackberry bushes north of the fence and along the railway ditch; approximately 200 drums, some full and bulging surrounded a crane on site, with soil covered with oozing and semi solid rosin like material; numerous fabric totes containing similar rosin material north of the fence line; black sand blast grit on the ground on the east side of the containment area; and suspicious looking yellow-orange crumbly pipe insulation on the ground, which was suspected to contain asbestos. Michael Spencer and

Mindy Miller left the site, called local representatives of Emergency Management and Labor & Industries to report findings, and referred the site to Ecology's Spill Response Team.

Norm Peck of Ecology's Northwest Regional Office visited the site, with Mindy Miller of WCHHS, on March 7, 2000 (see attached draft report "Inspection Summary for the Treoil Industries, Ltd. Site, Ferndale, WA", for a summary of findings). Mr. Peck listed several potential hazards including possible contribution by wastes at Treoil to elevated herring/herring egg mortality in intertidal and subtidal areas near the site. He recommended emergency interim actions for the site, and the United States Environmental Protection Agency (EPA) Region 10 and their contracted company, Ecology and the Environment responded.

EPA and Ecology and the Environment conducted a site visit and sampling at Treoil on June 6, 2000. Their observations and conclusions are summarized in the attached letter (9/14/00) to Mr. Gill from EPA's On-Scene Coordinator, Jeffry Rodin. Contamination confirmed in soil included TPH in the heavy oils and diesel range, PAHs, and metals (lead). Though some cleanup efforts have begun at the site, no final report has been received and the property will be scored and ranked under MTCA, using the Washington Ranking Method (WARM).

Special Considerations (Include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site):

ROUTE SCORES:

Surface Water/Human Health: 18.9

Surface Water/Environ.: 49.3

Air/Human Health: 4.2

Air/Environmental: 26.6

Ground Water/Human Health: 33.1

OVERALL RANK: 2

WORKSHEET 2
ROUTE DOCUMENTATION

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Source: 1

Contaminants found in soil include PAHs, lead and TPH diesel. Semi-solid resin in surface water caused fish mortality in a 96-hour Static Fish Bioassay Test, though specific chemicals are undetermined.

Explain basis for choice of substance(s) to be used in scoring.

Source: 1

Confirmed contaminants will be used in scoring, including PAHs, TPH and lead found in soil.

List those management units to be considered for scoring:

Source: 1,2

Spills, contaminated soils.

Explain basis for choice of unit to be used in scoring.

Soils found to contain levels of PAHs, lead and TPH above MTCA Cleanup levels.

Source: 1,2

2. AIR ROUTE

List those substances to be considered for scoring:

Source: 1

Contaminants found in soil include PAHs, lead and TPH diesel. Semi-solid resin in surface water caused fish mortality in a 96-hour Static Fish Bioassay Test, though specific chemicals are undetermined.

Explain basis for choice of substance(s) to be used in scoring.

Source: 1

Confirmed contaminants will be used in scoring, including PAHs, TPH and lead found in soil.

List those management units to be considered for scoring:

Source: 1,2

Spills, contaminated soils.

Explain basis for choice of unit to be used in scoring.

Source: 1,2

Soils found to contain levels of PAHs, lead and TPH above MTCA Cleanup levels.

3. GROUND WATER ROUTE

List those substances to be considered for scoring:

Source: 1

Contaminants found in soil include PAHs, lead and TPH diesel. Semi-solid resin in surface water caused fish mortality in a 96-hour Static Fish Bioassay Test, though specific chemicals are undetermined.

Explain basis for choice of substance(s) to be used in scoring.

Source: 1

Confirmed contaminants will be used in scoring, including PAHs, TPH and lead found in soil.

List those management units to be considered for scoring:
Spills, contaminated soils.

Source: 1,2

Explain basis for choice of unit to be used in scoring.
Soils found to contain levels of PAHs, lead and TPH above MTCA
Cleanup levels.

Source: 1,2

WORKSHEET 4
SURFACE WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard		Acute Toxicity		Chronic Toxicity		Carcinogenicity		
	(ug/l)	Val.	(mg/kg-bw)	Val.	(mg/kg/day)	Val.	WOE	PF*	Val.
1. TPH-Diesel	20	6	490 (rat)	5	0.004	3	x	x	x
2. Anthracene	-	-	-	-	0.3	1	x	x	x
3. Benzo(a)anthracene	0.2	10	-	-	-	-	0.8	9	7
4. Benzo(a)pyrene	0.2	10	50 (rat)	10	-	-	0.8	9	7
5. Benzo(b)fluoranthene	0.2	10	-	-	-	-	0.8	9	7
6. Benzo(g,h,i)perylene	-	-	-	-	-	-	x	x	x
7. Benzo(k)fluoranthene	0.2	10	-	-	-	-	0.8	9	7
8. Chrysene	0.2	10	-	-	-	-	0.8	9	7
9. Dibenzo(a,h)anthracene	0.2	10	-	-	-	-	0.8	9	7
10. Fluoranthene	-	-	2000 (rat)	3	0.04	1	x	x	x
11. Indeno(1,2,3-cd)pyrene	0.2	10	-	-	-	-	0.8	x	x
12. Phenanthrene	0.2	10	-	-	-	-	x	x	x
13. Pyrene	0.2	10	2700 (rat)	3	0.03	1	x	x	x
14. Lead	5	8	-	-	-	-	0.8	x	x

*Potency Factor

Source: 3,4

Highest Value: 10

(Max.=10)

+2 Bonus Points? 2

Final Toxicity Value: 12

(Max.=12)

1.2 Environmental Toxicity

Substance	(x) Freshwater () Marine		Non-human Mammalian		Source: <u>3,4</u>	Value: <u>10</u>
	Acute Water Quality Criteria		Acute Toxicity			
	(ug/l)	Value	(mg/kg)	Value		(Max.=10)
1. TPH-Diesel	2300	2	490 (rat)	5		
2. Anthracene	-	-	-	-		
3. Benzo(a)anthracene	-	-	-	-		
4. Benzo(a)pyrene	-	-	50 (rat)	10		
5. Benzo(b)fluoranthene	-	-	-	-		
6. Benzo(g,h,i)perylene	-	-	-	-		
7. Benzo(k)fluoranthene	-	-	-	-		
8. Chrysene	-	-	-	-		
9. Dibenzo(a,h)anthracene	-	-	-	-		
10. Fluoranthene	3980	2	-	-		
11. Indeno(1,2,3-cd)pyrene	-	-	-	-		
12. Phenanthrene	-	-	-	-		
13. Pyrene	-	-	2700 (rat)	3		
14. Lead	82	6	-	-		

WORKSHEET 4 (CONTINUED)
SURFACE WATER ROUTE

1.3 Substance Quantity: unknown, use default = 1.

Source: 3 Value: 1
(Max.=10)

Explain basis: _____

2.0 MIGRATION POTENTIAL

2.1 Containment: no runon/runoff control

Source: 3 Value: 10
(Max.=10)

Explain basis: _____

2.2 Surface Soil Permeability: very deep, poor-mod.drained

Source: 7 Value: 3
(Max.=7)

2.3 Total Annual Precipitation: 41.7"

Source: 5 Value: 3
(Max.=5)

2.4 Max. 2-Yr/24-hour Precipitation: 3.5"

Source: 3 Value: 3
(Max.=5)

2.5 Flood Plain: not in a flood plain

Source: 10 Value: 0
(Max.=2)

2.6 Terrain Slope: <2%

Source: 7 Value: 0
(Max.=5)

3.0 TARGETS

3.1 Distance to Surface Water: <1000'

Source: 2 Value: 10
(Max.=10)

3.2 Population Served within 2 miles (See WARM Scoring
Manual Regarding Direction): pop.= 0 = 0

Source: 9 Value: 0
(Max.=75)

3.3 Area Irrigated within 2 miles 0.75 no. acres=
(Refer to note in 3.2.): 0.75 √ 0 = 0

Source: 9 Value: 0
(Max.=30)

3.4 Distance to Nearest Fishery Resource: >5000'-10,000'

Source: 10 Value: 3
(Max.=12)

3.5 Distance to, and Name(s) of, Nearest Sensitive
Environment(s) <1000' to wetland

Source: 11 Value: 12
(Max.=12)

4.0 RELEASE

Explain basis for scoring a release to surface
water: none

Source: 3 Value: 0
(Max.=5)

WORKSHEET 5
AIR ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Introduction (WARM Scoring Manual) - Please review before scoring

1.2 Human Toxicity

Substance	Air Standard		Acute Toxicity		Chronic Toxicity		Carcinogenicity		
	(ug/m ³)	Val.	(mg/m ³)	Val.	(mg/kg/day)	Val.	WOE	PF*	Val.
1. TPH-Diesel	166.5	4	-	-	0.004	3	-	-	-
2. Anthracene	-	-	-	-	0.3	1	-	-	-
3. Benzo(a)anthracene	-	-	-	-	-	-	0.8	-	-
4. Benzo(a)pyrene	0.0006	10	-	-	-	-	0.8	-	-
5. Benzo(b)fluoranthene	-	-	-	-	-	-	0.8	-	-
6. Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-
7. Benzo(k)fluoranthene	-	-	-	-	-	-	0.8	-	-
8. Chrysene	-	-	-	-	-	-	0.8	-	-
9. Dibenzo(a,h)anthracene	-	-	-	-	-	-	0.8	-	-
10. Fluoranthene	-	-	-	-	0.04	1	-	-	-
11. Indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	-	-	-
12. Phenanthrene	-	-	-	-	-	-	-	-	-
13. Pyrene	-	-	170rat	8	0.03	1	-	-	-
14. Lead	0.5	10	-	-	-	-	-	-	-

*Potency Factor

Source: 3, 4
Highest Value: 10
(Max.=10)

+2 Bonus Points? 2
Final Toxicity Value: 12
(Max.=12)

1.3 Mobility (Use numbers to refer to above listed substances)

1.3.1 Gaseous Mobility

Vapor Pressure(s) (mmHg): 1)=8.2E-02=3, 2)=2.0E-04=2, 3)=2.2E-08=1, 4)=5.6E-09=1, 5)=5.0E-07=1, 6)=1.0E-10=1, 7)=5.1E-07=1, 8)=6.3E-09=1, 9)=1.0E-10=1, 10)=5.0E-06=1, 11)=1.0E-10=1, 12)=6.8E-04=2, 13)=2.5E-06=1, 14)=0

Source: 3, 4 Value: 3
(Max.=4)

1.3.2 Particulate Mobility -

Soil type: silty loam
Erodibility: 47
Climatic Factor: 1-10

Source: 3 Value: 1
(Max.=4)

1.4 Highest Human Health Toxicity/Mobility Matrix Value

(from Table A-7) equals **Final Matrix**,
gaseous mobility=6, particulate mobility=6

Value: 6
(Max.=24)

WORKSHEET 5 (CONTINUED)
AIR ROUTE

1.5 Environmental Toxicity/Mobility

Source: 3,4

Substance	Non-human Mammalian Acute		(Table A-7)	
	Inhal. Toxicity (mg/m ³)	Value	Mobility (mmHg)	Value
1. TPH-Diesel	-	-	8.2 E -02	3
2. Anthracene	-	-	2.4 E -04	2
3. Benzo(a)anthracene	-	-	2.2 E -08	1
4. Benzo(a)pyrene	-	-	5.6 E -09	1
5. Benzo(b)fluoranthene	-	-	5.0 E -07	1
6. Benzo(g,h,i)perylene	-	-	1.0 E -10	1
7. Benzo(k)fluoranthene	-	-	5.1 E -07	1
8. Chrysene	-	-	6.3 E -09	1
9. Dibenzo(a,h)anthracene	-	-	1.0 E -10	1
10. Fluoranthene	-	-	5.0 E -06	1
11. Indeno(1,2,3-cd)pyrene	-	-	1.0 E -10	1
12. Phenanthrene	-	-	6.8 E -04	2
13. Pyrene	170rat	8	2.5 E -06	1
14. Lead	-	-	0.0 E +00	3

Highest Environmental Toxicity/Mobility Matrix Value

(From Table A-7) equals **Final Matrix Value: 4**
(Max.=24)

1.6 Substance Quantity: Unknown default = 1 Source: 3 Value: 1
Explain basis: (Max.=10)

2.0 MIGRATION POTENTIAL

2.1 Containment: surface spill no vapor collection Source: 2, 3 Value: 10
(Max.=10)

3.0 TARGETS

3.1 Nearest Population: >1000-2000' (residence) Source: 2 Value: 8
(Max.=10)

3.2 Distance to, and Name(s) of, Nearest Sensitive Environment(s) wetland <1000ft Source: 11 Value: 7
(Max.=7)

3.3 Population within 0.5 miles: pop.= (.25) 34 = 9 Source: 8 Value: 3
(Note: am using one-quarter of the 0-1 mile population determined from the U.S. EPA SITEINFO database)
(Max.=75)

4.0 RELEASE

Explain basis for scoring a release to air: None documented. Source: 3 Value: 0
(Max.=5)

WORKSHEET 6
GROUND WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard		Acute Toxicity		Chronic Toxicity		Carcinogenicity		
	(ug/l)	Val.	(mg/kg-bw)	Val.	(mg/kg/day)	Val.	WOE	PF*	Val.
1. TPH-Diesel	20	6	490 (rat)	5	0.004	3	x	x	x
2. Anthracene	-	-	-	-	0.3	1	x	x	x
3. Benzo(a)anthracene	0.2	10	-	-	-	-	0.8	9	7
4. Benzo(a)pyrene	0.2	10	50 (rat)	10	-	-	0.8	9	7
5. Benzo(b)fluoranthene	0.2	10	-	-	-	-	0.8	9	7
6. Benzo(g,h,i)perylene	-	-	-	-	-	-	x	x	x
7. Benzo(k)fluoranthene	0.2	10	-	-	-	-	0.8	9	7
8. Chrysene	0.2	10	-	-	-	-	0.8	9	7
9. Dibenzo(a,h)anthracene	0.2	10	-	-	-	-	0.8	9	7
10. Fluoranthene	-	-	2000 (rat)	3	0.04	1	x	x	x
11. Indeno(1,2,3-cd)pyrene	0.2	10	-	-	-	-	0.8	x	x
12. Phenanthrene	0.2	10	-	-	-	-	x	x	x
13. Pyrene	0.2	10	2700 (rat)	3	0.03	1	x	x	x
14. Lead	5	8	-	-	-	-	0.8	x	x

*Potency Factor

Source: 3, 4
Highest Value: 10
(Max.=10)
+2 Bonus Points? 2
Final Toxicity Value: 12
(Max.=12)

1.2 Mobility (Use numbers to refer to above listed substances)

Cations/Anions: 14)=2 Source: 3 Value: 2
(Max.=3)

OR

Solubility(mg/l): 1)=1, 2)=0, 3)=0, 4)=0, 5)=0, 6)=0, 7)=0, 8)=0,
9)=0, 10)=0, 11)=0, 12)=0, 13)=0

1.3 Substance Quantity: Unknown = 1 Source: 3 Value: 1
Explain basis: _____
(Max.=10)

2.0 MIGRATION POTENTIAL

2.1 Containment Source: 3 Value: 10
Explain basis spill
(Max.=10)
No liner = ; low permeability cover = ; No
leachate collection system = ; possible free liquids =

WORKSHEET 6 (CONTINUED)
GROUND WATER ROUTE

2.2 Net Precipitation: 28.4-5.2=23.2 inches Source: 5 Value: 3
(Max.=5)

2.3 Subsurface Hydraulic Conductivity: moderate drainage Source: 3 Value: 2
(Max.=4)

2.4 Vertical Depth to Ground Water: 25-50 Source: 3,6 Value: 6
(Max.=8)

3.0 TARGETS

3.1 Ground Water Usage: public/private Source: 3 Value: 4
(Max.=10)

3.2 Dist. to Nearest Drinking Water Well: >2640-5000 Source: 3,6 Value: 2
(Max.=5)

3.3 Population Served within 2 Miles: 480 Source: 3,6 Value: 22
(Max.=100)

3.4 Area Irrigated by (Groundwater) Wells
within 2 miles: 0.75 no. acres = Source: 3,6,9 Value: 4
0.75 $\sqrt{35}$ = 0.75 () = 4.44 (Max.=50)

4.0 RELEASE

Explain basis for scoring a release to ground water: Source: 3 Value: 0
(Max.=5)

SOURCES USED IN SCORING

1. Analytical Results, United States Environmental Protection Agency Region 10 June 6, 2000 Investigation (summarized in letter to Mr. Gill, 9/14/00).
2. Relevant Site History/Investigations/Whatcom County Health & Human Services File.
3. Washington State Department of Ecology, WARM Scoring Manual, April 1992
4. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
5. Washington State University Cooperative Extension Service, Washington Climate.
6. Well Log, Whatcom County Health & Human Services File.
7. Soil Survey of Whatcom County Area, Washington, United States Department of Agriculture, Soil Conservation Service (1985).
8. U.S. EPA SITEINFO GIS Query for site.
9. Water Rights Application Tracking System, NWRO Ecology, List of Wells in Surrounding Area.
10. Whatcom County Planning & Development (map), CAO Articles III & IV (Geohaz. & Flooding) T39N - R1E, 6/1/98.
10. Whatcom County Planning & Development (map), Fish Habitat, 3/1/99.
11. Whatcom County Planning & Development (map), CAO Articles V & VI (Aquifer & Wetland) T39N - R1E, 6/1/98.

INGTON RANKING METHOD SCORING PACKAGE

. Press F9 to calculate scores.

WORKSHEET 4 SURFACE WATER ROUTE

	Site 1	Site 2	Site 3
=====	=====	=====	=====
UBSTANCE CHARACTERISTICS			

Human Health Toxicity	12	0	0
Environmental Toxicity	10	0	0
Substance Quantity	1	0	0
Containment	10	0	0

MIGRATION			

Soil Permeability	3	0	0
Annual Precipitation	3	0	0
2-yr/24-hour Precip.	3	0	0
Flood Plain	0	0	0
Terrain Slope	0	0	0

TARGETS			

Distance to Surf. Water	10	0	0
Population Served	0	0	0
Area Irrigated	0	0	0
Distance to Fisheries	3	0	0
Sensitive Environment	12	0	0

RELEASE	0	0	0
=====	=====	=====	=====
SW HH ROUTE SCORE	18.9	0.0	0.0
SW Env. ROUTE SCORE	49.3	0.0	0.0
=====	=====	=====	=====
=====	=====	=====	=====

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WORKSHEET 5
AIR ROUTE

=====	=====	=====	=====
UBSTANCE CHARACTERISTICS			

HH Tox/Mobility	6	0	0
Env Tox/Mobility	4	0	0
Substance Quantity	1	0	0
Containment	10	0	0

TARGETS			

Nearest Population	8	0	0
Sensitive Environment	7	0	0
Population within 1/2 mi	3	0	0

RELEASE	0	0	0

=====	=====	=====	=====
AIR HH ROUTE SCORE	4.2	0.0	0.0
AIR ENV. ROUTE SCORE	26.6	0.0	0.0
=====	=====	=====	=====
=====	=====	=====	=====

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WORKSHEET 6
GROUND WATER ROUTE

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UBSTANCE CHARACTERISTICS			

Toxicity	12	0	0
Mobility	2	0	0
Substance Quantity	1	0	0
Containment	10	0	0

MIGRATION			

Net Precipitation	3	0	0
Hydraulic Conductivity	2	0	0
Depth to Ground Water	6	0	0
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TARGETS			

Aquifer Usage	4	0	0
Nearest Well Distance	2	0	0
Population Served	22	0	0
Area Irrigated	4	0	0
-----		-----	-----
RELEASE	0	0	0
=====	=====	=====	=====
GW ROUTE SCORE	33.1	0.0	0.0
=====	=====	=====	=====
=====	=====	=====	=====

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SCORE SUMMARY	Site 1	Site 2	Site 3
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Surface Water Human Health	18.9	0.0	0.0
Air Human Health	4.2	0.0	0.0
Ground Water Human Health	33.1	0.0	0.0
Surface Water Environment	49.3	0.0	0.0
Air Environment	26.6	0.0	0.0